

APPENDIX A

Sequence Comparison — Mouse vs. Human TERT

Mouse TERT protein sequence

LOCUS 070372 1122 aa linear ROD 15-JUN-2002
 DEFINITION Telomerase reverse transcriptase (Telomerase catalytic subunit).
 ORGANISM Mus musculus
 AUTHORS Greenberg,R.A., Allsopp,R.C., Chin,L., Morin,G.B. and DePinho,R.A.
 TITLE Expression of mouse telomerase reverse transcriptase during
 development, differentiation and proliferation
 JOURNAL Oncogene 16 (13), 1723-1730 (1998)

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1 mtraprcpav rsllrsryre vwplatfvrr lgpegrrlvq pgdpkiyrtl vaqclvcmhv
61 gsqpppadls fhqvsskel varvvqlce rnernvlafg fellneargg ppmaftssvr
121 sylpntviet lrvsgawml lsvgddllv yllahcalyl lvppscayqv cgsplyqica
181 ttdiwpvsas syrptrpvgr nftnlrflqq iksssrqcap kplalpsrgt krhlsltsts
241 vpsakkarcy pvrprveegph rqlvptpsgk swvpsparsp evptaekdls skgkvsdls
301 sgsvcckhkp sstslsppr qnafqlrpf iethflysrg dgqerlnpsf llsnlqpnlt
361 garrlveiif lgsrprtsqp lcrthrlsrr ywqmrplfq llvnhacqy vrllrshcrf
421 rtanqqvtda lntspplmd lrlhsspwq vygflraclc kvvsaslwgt rhnerrffkn
481 lkkfislgyk gklslqelmw kmkvedchw rsspdkdrvp aaehrlreri latflfwlmd
541 tyvvqllrsf fyitestfqq nrlffyrksv wsklqsigvr qhlervlre lsqeevrhhq
601 dtwlampicr lrfipkpngr rpivnmsysm gtralgrrkq aqhftqrlkt lfsmlnyert
661 khphlmgsav lgmndiyrtw rafvlrvral dqtprmyfvk advtgaydai pggklvevva
721 nmirhsesty cirqyavvrr dsqgqvhsf rrqvttlsdl qpymgqflkh lqdsdasalr
781 nsvvieqsis mnesssslfd fflhflrhsv vkigdrctyq cqgipqgssl stllcslcfcg
841 dmenklfaev qrdglllrfrv ddfllvtphl dqaktflstl vhgvpqygm inlqktvvnf
901 pvepgtlgga apyqlpahcl fpwcgllldt qtlevfcdys gyaqtsikts ltfqsvfkag
961 ktmrnklslv lrikchglfl dlqvnslqtv ciniykifll qayrfhacvi qlpfdqrvrk
1021 nltfflgiis sqasccyail kvknpgmtlk asgsfppeaa hwlcyaqall klaahsviyk
1081 cllgplrtaq klcrklpea tmtilkaaad palstdfkti ld
  
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Human TERT protein sequence

LOCUS 014746 1132 aa linear PRI 15-JUN-2002
 DEFINITION Telomerase reverse transcriptase (Telomerase catalytic subunit)
 ORGANISM Homo sapiens
 AUTHORS Nakamura,T.M., Morin,G.B., Chapman,K.B., Weinrich,S.L.,
 Andrews,W.H., Lingner,J., Harley,C.B. and Cech,T.R.
 TITLE Telomerase catalytic subunit homologs from fission yeast and human
 JOURNAL Science 277 (5328), 955-959 (1997)

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1 mpraprcrav rsllrshyre vlplatfvrr lpgqgwrlvq rgdpaafral vaqclvcvpw
61 darpppaaps frqvscikel varvlqlrce rgaknvlafg falldgargg ppeaftssvr
121 sylpntvtda lrgsgawgl lrrvgddvlv hllarcalfv lvapscayqv cgplyqlga
181 atqarpppha sgprrrlgce rawnhsvrea gvplglpapg arrrggsasr slplpkprrr
241 gaapeperrp vggswahpg rtrgpsdrgr cvvsparpae eatslegals gtrhshpsvg
301 rqhahagpst srpprpwdtp cppvyaetkh flyssgkdeq lrpsfllssl rpsltgarri
361 vetiflgsrp wmpgtprrrl rlpqrywqmr plflellgnh aqcpygvllk thcplraavt
421 paagvcarek pqgsvaapee edtdprrlvq llrqhsspwq vygfvracrl rlvppglwgs
481 rhnerrflrn tkkfislghk aklsiqeltw kmsvrdcawl rrspgvgcvp aaehrlreei
541 lakflhlwms vyvvellrsf fyvtettfqq nrlffyrksv wsklqsigir qhlkrvqlre
601 lseaevqrhr earpalltsr lrfipkpdgl rpivnmdivv gartfrrekr aerltsrvka
661 lfsvlneyra rrppllgasv lglddihrav rtfvlrvraq dpppelyfvk vdtgaydti
721 pqdrltevia siikpntyc vrryavvqka ahghvrkafk shvstltdlq pymrqfvahl
781 qetsplrdav vieqssslne assglfdvfl rfmchhavri rgksyvcqcg ipqgsilstl
841 lcslycdgme nklfagirrd gllrlvddf llvtphltha ktflrtlvrq vpeygcvnvl
901 rktvvnpvpe dealggtafv qmpahglfpw cgllldtrtl evqsdysya rtsirasltf
961 nrgfkagrnm rrrkfgvlrl kchslfldlq vnsltqvctn iykilllqay rfhacvlqlp
1021 fhqqvwknpt fflrvisdta slcysilkak nagmslgakg aagplpseav qwlchqafl
1081 kltrhrvtyv pllgslrtaq tqslrklpgt tltaleaaan palpsdfkti ld
  
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Sequence Comparison

Performed at the following website:
<http://www.ncbi.nlm.nih.gov/blast/bl2seq/bl2.html>

Score = 1340 bits (3468), Expect = 0.0
Identities = 715/1146 (62%), Positives = 839/1146 (72%), Gaps = 38/1146 (3%)



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mouse: 1   MTRAPRCPAVRSLLRSRYREVWPLATFVRRLLGPEGRRLLVQPGDPKIYRTLVAQCLVCMHW 60
          M RAPRC AVRSLLRS YREV PLATFVRRLLGP+G RLVQ GDP +R LVAQCLVC+ W
human: 1   MPRAPRCRAVRSLLRSHYREVLPLATFVRRLLGPQGWRLVQRGDPAAFRALVAQCLVCVPW 60

mouse: 61   GSQPPPADLSFHQVSSLKELVARVVQRLCERNERNVLAFGFELLNEARGGPPMAFTSSVR 120
          ++PPPA SF QVS LKELVARV+QRLCER +NVLAFGF LL+ ARGGPP AFT+SVR
human: 61   DARPPPAAPSFRQVSLKELVARVLQRLCERGAKNVLAFGFALLDGARGGPPEAFTTSVR 120

mouse: 121  SYLPNTVIETLRVSGAWMLLSRVGDDLLVYLLAHCALYLLVPPSCAYQVCGSPLYQICA 180
          SYLPNTV + LR SGAW LLL RVGDD+LV+LLA CAL++LV PSCAYQVCG PLYQ+ A
human: 121  SYLPNTVTDALRGSGAWGLLLRRVGGDDVLVHLLARCALFVLVAPSCAYQVCGPPPLYQLGA 180

mouse: 181  TTDIWPSVSASYRPTRPVGRNFTNLRFLQKIKSSSRQEAPKPLALPSRGTKRHLSLTSTS 240
          T P AS P R +G ++ + S +EA PL LP+ G +R S S
human: 181  ATQARPPPHAS-GPRRRLG-----CERAWNHSVREAGVPLGLPAPGARRRGGSASRS 231

mouse: 241  VPSAKKARCYPVPRVEEGPHRQVLPTPSGKSWVSPAR---SPEVPTAEKDLSSKGKVS 296
          +P K+R R P E P Q G++ PS SP P AE+ S +G +S
human: 232  LPLPKRPRRGAAPERTPVGQGSWAHPGTRGPSDRGFCVVSPARP-AEEATSLEGALS 290

mouse: 297  DLSLSG-SVCCCHKPSSTSLLSPPRQNAFQLRP-FIETRHFLYSRGDGQERLNPSFLLSN 354
          S SV +H S PPR P + ET+HFLYS GD +E+L PSFLLS+
human: 291  GTRHSHPSVGRQHHAGPPSTSRPPRPWDTPCPPVAETKHFYSSGD-KEQLRPSFLLSS 349

mouse: 355  LQPNLTGARRLVEIIFLGSRPRTSGPLCRTHLSRRYQWMRPLFQQLLVNHAECQYVRL 414
          L+P+LTGARRLVE IFLGSRP G R RL +RYWQMRPLF +LL NHA+C Y LL
human: 350  LRPSLTGARRLVETIFLGSRPWPMPGTPRRLPRLPQRYWQMRPLFLELLGNHAQCPYGVLL 409

mouse: 415  RSHCRFTA-----NQQVTDALNTSPPHMDLLRLHSSPWQVYGFLRACL 459
          ++HC R A + + +T P L+ LLR HSSPWQVYGF+RACL
human: 410  KTHCPLRAAVTPAAGVCAREKPQGSVAAPEEEDTPRRLVQLLRQHSSPWQVYGFVRACL 469

mouse: 460  CKVVSASLWGTRHNERRFFKNLKKFISLGKGLSLQELMWMKMKVEDCHWLRSSPGKDRV 519
          ++V LWG+RHNERRF +N KKFISLGK+ KLSLQEL WKM V DC WLR SPG V
human: 470  RRLVPPGLWGSRHNERFLRNTKKFISLGKHAKLSLQELTWKMSVRDCAWLRRSPGVGCV 529

mouse: 520  PAAEHLRERILATFLFWLMDTYVVQLLRSFFYITESTFQKNRLFFYRKSVWSKLQSIGV 579
          PAAEHLRRE ILA FL WLM YVV+LLRSFFY+TE+TFQKNRLFFYRKSVWSKLQSIG+
human: 530  PAAEHLRREEILAKFLHWMLSVYVVELLRSFFYVTETTFQKNRLFFYRKSVWSKLQSIGI 589

mouse: 580  RQHLERVRLRELSQEEVRHHQDTWLAMPICRLRFIPKPNGLRPIVNMYSYMGTRALGRRK 639
          RQHL+RV+LRELS+ EVR H++ A+ RLRFIKPK+GLRPIVNM Y +G R R K
human: 590  RQHLKRVQLRELSEAEVRQHREARPALLTSRLRFIPKPDGLRPIVNM DYVVGARTFRREK 649

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mouse: 640 QAQHFTQRLKTLFSLNRYERTKHPHLMGSSVLGMNDIYRTWRAFLVRALDQTPRMVYFV 699
+A+ T R+K LFS+LNYER + P L+G+SVLG++DI+R WR FVLRVRA D P +YFV
human: 650 RAERLTSRVKALFSVLNRYERARRPGLLGASVLGLDDIHRAWRTFVLRVRAQDPPPELYFV 709

mouse: 700 KADVTGAYDAIPQGKLVEVVANMIRHSESTYCIQYAVVRRDSQGQVHKSFRRQVTTLS 759
K DVTGAYD IPQ +L EV+A++I+ ++TYC+R+YAVV++ + G V K+F+ V+TL+D
human: 710 KVDVTGAYDTIPQDRLTEVIASIIK-PQNTYCVRRYAVVQAAHGHVRKAFKSHVSTLTD 768

mouse: 760 LQPYMGQFLKHLQDSDASALRNSVVEIQSISMNESSSLDFDLHFLRHSVVKIGDRCYT 819
LQPYM QF+ HLQ++ S LR++VVIEQS S+NE+SS LFD FL F+ H V+I + Y
human: 769 LQPYMRQFVAHLQET--SPLRDAVVIEQSSSLNEASSGLFDVFLRFMCHHAVRIRGKSYV 826

mouse: 820 QCQGIPOGSSLSTLLCSLCFGDMENKLFAEVQRDGLLLRFVDDFLLVTPHLDQAKTFLST 879
QCQGIPOGS LSTLLCSLC+GDMENKLFA ++RDGLLLR VDDFLLVTPHL AKTFL T
human: 827 QCQGIPOGSILSTLLCSLCYGD MENKLFAGIRRDGLLLRLVDDFLLVTPHLTHAKTFLRT 886

mouse: 880 LVHGVPEYGC MINLQKT VVNFVPEPGLGGAAPYQLPAHCLFPWCGLLLDQTLEVFCDY 939
LV GVPEYGC++NL+KTVVNFVPE LGG A Q+PAH LFPWCGLLLD+TLEV DY
human: 887 LVRGVPEYGC VVNLKTVVNFVPEDEALGGTAFVQMPAHGLFPWCGLLLDTRTLEVQSDY 946

mouse: 940 SGYAQTSIKTSLTFQSVFKAGKTMRNKL SVLR LKCHGLFLDLQVNSLQTVCTINIYKIFL 999
S YA+TSI+ SLTF FKAG+ MR KL VLRLKCH LFLDLQVNSLQTVCT NIYKI L
human: 947 SSYARTSIRASLTFNRGFKAGRNMRRKLFGLRLKCHSLFLDLQVNSLQTVCTNIYKILL 1006

mouse: 1000 LQAYRFHACVIQLPFDQVRKNLTFGLGISSQASCCYAILKVKNPGMTLKASGS---FP 1056
LQAYRFHACV+QLPF Q+V KN TFFL +IS AS CY+ILK KN GM+L A G+ P
human: 1007 LQAYRFHACVLQLPFHQVWKNPTFFLRVISDTASLCYSILKAKNAGMSLGAKGAAGPLP 1066

mouse: 1057 PEAHWLCYQAFLLKLAH SVIYKCLLGLR TAQKLLCRKLPEATMTILKAAADPALSTD 1116
EA WLC+QAFLLKL H V Y LLG LRTAQ L RKLP T+T L+AAA+PAL +D
human: 1067 SEAVQWLCHQAFLLKLTRHRTYVPLLGLSLRTAQQLSRKLP GTTLTALEAAANPALPSD 1126

mouse: 1117 FQTILD 1122
F+TILD
human: 1127 FKTILD 1132